REMARKS

Claims 9-20 remain in this application. Claims 1-8 were previously canceled. Reconsideration of the application is requested.

The same parts of the invention appearing in Figures 1 and 2 of this application are designated by the same reference characters, and the same reference character is not used in Figures 1 and 2 of this application to designate different parts of the invention. While the comments provided in section 1 on page 2 of the Office Action are noted, nothing identified by the Examiner in this section constitutes a violation of 37 C.F.R. § 1.84(p)(4), and withdrawal of the objection to the drawings set forth in section 1 of the Office Action is requested.

Reference character "A" is mentioned in paragraph 0002 of the substitute specification filed May 26, 2006, and withdrawal of the objection to the drawings set forth in section 2 on pages 2-3 of the Office Action is requested.

The dependency of claim 20 is corrected above, and the objection set forth in section 3 on page 3 of the Office Action is no longer applicable.

The Abstract of the Disclosure supplied by way of the preliminary amendment filed May 26, 2006, does not include the word "said," and the objection set forth in section 5 on page 4 of the Office Action should be withdrawn.

Reconsideration of the rejection under 35 U.S.C. § 112, second paragraph, set forth in sections 6-9 on page 4 of the Office Action is requested. Use of the term "at least" in patent claims is acceptable, as evidenced by claims 1 and 10 of U.S. Patent 5,615,481 to Viegener et al. and claim 6 of U.S. Patent 6,843,096, also to Viegener et al., both of record. Similarly, use of the term "substantially"

in patent claims is acceptable, as evidenced by claim 1 of U.S. Patent 4,768,369 to Johnson et al., also of record. These terms are not used in the claims of the present application in a way that is unclear, and the rejection of claims 9, 13, and 16 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

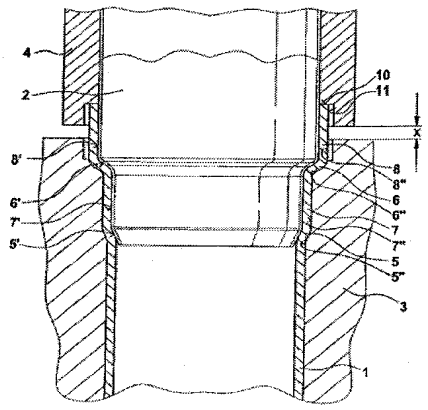
Reconsideration of the non-statutory double patenting rejection of claim 9 set forth in section 11 of the Office Action is requested. Nothing noted in section 11 suggests modifying the process defined by claim 1 of the Viegener et al. ('096) patent to include the act or operation of expanding a region of a pipe end to provide an expanded region of the pipe end with an enlarged wall thickness no earlier than introduction of the expansion tool into the pipe end as claim 9 now requires.

A brief discussion of certain features of the invention is set forth prior to discussions of the remaining claim rejections. The present invention concerns a method and an apparatus for making a socket on a pipe end in which an end section of the pipe is widened in order to increase the end section inner diameter. This is done by introducing an expansion tool axially into the pipe end. The widened section is cylindrical, has an increased inner diameter, and includes the face side of the pipe at the respective end.

Because the diameter in the expanded section is increased, the wall thickness decreases correspondingly. This is critical, since the expanded end section is subsequently to be used as a socket for connecting the pipe to other hydraulic or pneumatic parts. A flange is formed inwardly at the end of the pipe, which flange serves as support for sealing elements. As the stress at this part of the socket is very high, the invention is intended to avoid damage, and thus

leakage, at the socket by increasing the wall thickness in the expanded end section having the increased inner diameter.

An increase in wall thickness is created by way of an upsetting device having an annular recess, which receives, in part, the expanded section of the pipe. The expanded end section is also partly received in a shaping shoe surrounding the pipe. The inner diameters of the recess and the shaping shoe are coordinated in order to limit the outer diameter of the expanded section. Depending on the stroke of the upsetting device, the desired wall thickness of the expanded end section is achieved. The upsetting device is pressed against the face side of the pipe end, and the wall thickness in the expanded section increases until the outer diameter of the expanded end section corresponds to the desired outer diameter (see, for example, paragraph 0008 of the substitute specification). During the upsetting process, the inner diameter of the expanded end section is defined by the expansion tool inserted into the pipe end. Thus, during the upsetting process, material can only flow radially outward. This requires a certain play between the inner diameters of the recess and the shaping shoe, on the one hand, and the wall of the expanded section of the pipe, on the other hand. This play is illustrated below in a modified view similar to that provided by Figure 2 of the drawings.



Independent claim 9, independent claim 16, and dependent claims 17-20 are rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent application publication 2004/0003645 to Viegener et al. This application has now matured into the ('096) patent identified above. Reconsideration is requested.

As illustrated in Figure 2 of this application, at least at the beginning of the upsetting process, a gap exists between the upsetting tool and the shaping shoe. The expanded section of the pipe is not completely surrounded. It should have been expected that an upsetting process would be impossible with such an arrangement; referring, for example, to the Viegener et al. ('645) document, and particularly to Figure 8, one skilled in the art would have expected that, during upsetting of a non-surrounded pipe section, the material would bend radially outward, as shown in the Viegener et al. ('645) document. Surprisingly, however, it was found that, if the inner diameters of the recess and the shaping shoe are coordinated and the required stroke is executed, a consistent material flow is

achieved, and the wall thickness is increased and not bended or folded. The Viegener et al. ('645) document does not disclose a method or an apparatus for increasing the wall thickness in a cylindrical expanded end section of a pipe. These features are reflected by both independent claim 9 and independent claim 16 above, and the anticipation rejection of claims 9 and 16 is not presently applicable.

Neither of the additional secondary references discussed in sections 26-38 on pages 10-14 of the Office Action suggests modifying the Viegener et al. ('645) method or device so that it would have met the limitations noted. The Viegener et al. ('481) patent refers to a method and an apparatus for producing circumferentially compressible pipe fittings. The Viegener et al. ('481) method does involve expanding a cylindrical end section of a pipe in order to increase its inner diameter. The Viegener et al. ('481) method, explained in detail in lines 4-27 of column 6, forms bulges defining an inner circumferential groove by moving plungers 16, 16' into respective portions 12, 13 of a pipe. After the plungers have fully entered the pipe portions 12 13, upsetting sleeves 17, 17' abut the end faces of the pipe portions 12, 13 and push them into the bores 5, 6 of a die (see Figure 2). The upsetting sleeves 17, 17' are pushed further forward, and thus the material of the pipe portion 12, 13 bulges outwardly in the grooves 7, 8 of the die. While the regions of the grooves 7, 8 may experience a slight increase in wall thickness, this does not correspond to the present invention. In the present invention, a cylindrical expanded section is created in order to form a socket with a desired inner diameter greater than the diameter of the original pipe. In order to avoid damage caused by stress of the pipe, the reduced wall thickness, which

was created by expanding the end section of the pipe, is increased in a subsequent step to provide a socket having sufficient stability. Neither this problem nor its solution is mentioned in the Viegener et al. ('481) patent, since expansion of a cylindrical section of the pipe, which could result in a decreased wall thickness, is not mentioned. It follows that there is no need in the Viegener et al. ('481) method or apparatus to re-increase the wall thickness in a subsequent step, and one skilled in the art would not have found any suggestion leading to the presently claimed invention.

The Johnson et al. ('369) patent describes a method of forming a pipe fitting having a flange at its end. The inner diameter of the pipe end section is not widened, as can be seen, for example, in Figures 4-6. This type of pipe fitting does not correspond to the present invention, which refers to a socket having an expanded end section of cylindrical shape which can serve as receiving part for another pipe end or other hydraulic or pneumatic parts. Instead, according to the Johnson et al. patent disclosure, a radial flange is formed and can be provided with holes to fasten the flange to a further flange of another pipe fitting.

A primary feature of the present invention is avoiding weakening of a cylindrical expanded end section by re-increasing the wall thickness in the expanded area in a discrete act or operation. During this further act or operation, the wall thickness is increased, material of the expanded section flows radially outward, and the upsetting device, the shaping shoe, and the stroke of the upsetting device together define the outer diameter of the pipe.

It is respectfully submitted that both independent claim 9 and independent claim 16 above are patentable for reasons discussed. All other claims remaining in this application are dependent claims and should be patentable as well.

This application should now be in allowable condition. If there are any questions regarding this Reply or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an extension of time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #102475.57672US).

Respectfully submitted,

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